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ABSTRACT

This is one of a series of 14 instructional components of a semester-long, environmental earth science course developed for undergraduate students. The course includes lectures, discussion sessions, and individualized learning carrel lessons. Presented are the study guide and script for a learning carrel lesson on population. The slides, audio-cassette tape, and other materials necessary to the lesson are not included. (BT)

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2 of 16 parts

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SCIENCE EDUCATION CENTER

STUDY GUIDE AND SCRIPT

SECTION I: MAN'S EFFECT ON NATURE

LESSON 6.1: POPULATION

U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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ENVIRONMENTAL STUDIES

A Cooperative Project of The Department of Geological Sciences and the Science Education Center

The University of Texas at Austin

SE 028 776

ENVIRONMENTAL EARTH SCIENCE

"Environmental Earth Science" is a new course developed at The University of Texas at Austin by the Department of Geological Sciences and the Science Education Center. It is offered at The University of Texas at Austin as Geology 361K and has been tried out during the spring semesters of 1972, 1973, 1974, and 1975. Revisions have been made as necessary after each tryout. The project within which the course has been developed has been supported by the National Science Foundation.

The course includes lectures, discussion sessions, and individualized Learning Carrel Lessons. Extensive use has been made of multi-media technology in the presentation of the course. Learning Carrels for individualized instruction have been especially designed for this program. The lectures introduce specific topics, suggest problems or questions, and provide background information. The discussion sessions provide the student an opportunity to ask questions and clarify ideas. The discussion sessions also provide input and feedback to the instructor.

The Learning Carrel Lessons have been written by faculty and graduate students in the geological sciences and in science education. Writers and resource contributors include Dr. Robert Boyer, Dr. Rolland Bartholomew, Dr. Keith Young, Dr. Samuel Ellison, Dr. James Underwood, Dr. David Butts, Dr. Addison E. Lee, David Keller, Melanie Lewis, Wayne Schade, Ann Lee, and William McLoda. Technicians involved in production of scripts, sound, and photography were Stan Prescott, Lee West, Charles Geffen, and William McLoda. Artists were Jesus Rivas, Alice Canestaro, Aly Knox, and Javier Flores.

Each Learning Carrel Lesson consists of a set of 2 x 2 slides, an audio cassette tape, a study guide, a script, and other materials necessary to the lesson. The study guide and script are in this booklet. Students may set their own time schedule within an announced period when slides and tapes are made available.

The student should note the list of Learning Carrel Lesson topics to place in proper content the lesson in this booklet, and then read carefully the introduction, rationale, prerequisites, and lesson objectives in the study guide. The student should follow the instructions in the study guide for the entire lesson. In some instances, these instructions are also repeated on the audio cassette tape. The slides and tapes have been synchronized to automatically advance the slides appropriate to the audiotape. However, there is a tone signal given before the change of each slide so that the lesson can be used outside of the carrel if automatic facilities are not available. When the student is ready to start the lesson, the "on" switch should be pushed. If the slides and tape are operated manually, both will need to be turned "on." The first slide is always a title slide or a blank solid colored slide. If

the slides and tape are manually operated, this title or blank slide should be on view before the tape is started. For automatic operation, the slides and tapes will be set up by the Instructor or Proctor before the lesson and between each use. It is most important to start each lesson according to these instructions in order to provide synchronization of the slides and tape. Remember that slides placed in the tray to be used with a rear view screen are reversed from those to be used with a front view screen.

The student will be instructed by the study guide and/or the tape to stop at various places to carry out certain activities. Usually the audio-tape will say, "Please stop the tape now and restart only when you have finished this exercise." Therefore, the student should wait a few seconds to finish hearing the instruction after the word "Stop." However, one should not wait long enough for the tone signal or automatic change to the next slide. This signal should be heard after you restart the tape. If the lesson is moving too rapidly, the student may stop the tape and slides at any time to consult the study guide or script, but it is NOT POSSIBLE to back up and re-examine a given slide without completing the entire cycle of the lesson.

It is particularly important for the student to carry out the instructions for activities given in the study guide. In order that a record may be maintained of these activities, each student should pick up a copy of the STUDENT RESPONSE SHEET which include questions to be answered and the other activities requiring responses. These should be completed and turned in to the instructor as required for grading, feedback for the instructor, and to provide a basis for student interaction in the discussion group.

Each Learning Carrel Lesson is independent within the context of the course. Some of them provide direct information on a given topic, but in an individualized mode requiring some activities and thought on the part of the student. Others place the student in a role-playing situation where some position must be taken on provocative questions or issues. Others deal primarily with applications of environmental information. In all the lessons, the student is expected to receive basic information that is coordinated with the lectures, the small group discussions, and the readings.

ENVIRONMENTAL EARTH SCIENCE

LEARNING CARREL LESSONS

Section I: Man's Effect on Nature

Lesson 6.1: Population
Lesson 6.2: Land Use
Lesson 6.3: Urban Crisis (Field Trip)

Section II: Energy

Lesson 6.4: Energy
Lesson 6.5: Energy Resources
Lesson 6.6: Future Projections

Section III: Processes Through Time

Lesson 6.7: Geologic Time
Lesson 6.8: Long Term Events
Lesson 6.9: Short Term Events

Section IV: Natural Resources

Lesson 6.10: Minerals
Lesson 6.11: Conflicts of Interest
Lesson 6.12: Soils
Lesson 6.13: Water

Section V: Oceanography

Lesson 6.14: Ocean Resources
Lesson 6.15: Pollution of the Oceans

STUDY GUIDE FOR LEARNING CARREL LESSON

6.1

POPULATION

ENVIRONMENTAL STUDIES

A Cooperative Project of the Department of Geological Sciences and the Science Education Center

THE UNIVERSITY OF TEXAS AT AUSTIN

TO THE STUDENT:

This booklet contains two sections: (1) the Student Study Guide for this lesson, and (2) the Script or printed copy of the discussion recorded on the audio cassette tape.

You are expected to begin with the printed instructions in the Study Guide and follow them continuously as you study the lesson. In many instances the same or similar instructions may also be heard on the audio cassette tape. Refer to the script only if you need to refresh your memory as to something that was said. The script is provided because you cannot back up the tape if you need to review something already said on the tape.

Specific instructions will be given in the Study Guide as to when to start and stop the tape. Do not restart the tape until instructed to do so in the Study Guide.

Questions requiring written answers should be completed on the STUDENT RESPONSE SHEETS provided by the Instructor.

INSTRUCTIONS:

1. Read the Introduction, Rationale and Objectives for this lesson that follows. If you have questions, check with the Instructor or Proctor.

INTRODUCTION:

Individuals enter the human community by birth and they leave it by death; at certain points in life they may generate sons and daughters. From these simple observations follows the entire process of the increase and decline of human populations. Whether death occurs on the average at 30 years or at 70, whether a woman bears two children or three on the average--such facts determine whether populations grow or remain stationary, and whether the planet as a whole becomes overloaded and deteriorates or remains hospitable to human societies.

The purpose of this particular program is twofold: (1) to give you some information about human populations, and (2) to encourage you to make some personal decisions about "the population problem."

During this lesson you will be requested to answer questions in this Study Guide. THESE QUESTIONS ARE NOT A TEST. Each question is intended to focus your attention on an important part of the lesson presented in the program. Your involvement in answering the questions will determine to a great extent how much you learn from this lesson.

RATIONALE:

How many people there are on this planet determines the amount of pollution and the speed at which natural resources are used up. Overpopulation may increase pollution and decrease our natural resources. It also lowers the aesthetic level of life.

If overpopulation is a problem, it is your responsibility as a member of the population (as a human being) to help solve the problem. To do this, you must study the factors that control population growth or decline and what may be done to maintain a suitable population level.

OBJECTIVES OF THIS LESSON:

At the end of this lesson you should be able to:

1. name factors which contribute to human overpopulation
2. identify the possible consequences of human overpopulation
3. describe the relationships between a country's economic development and population growth rate
4. apply the rule that growth rate is the difference between birthrate and deathrate
5. define Zero Population Growth
6. state two reasons why a stable U.S. population should result in a higher U.S. standard of living than a growing population
7. identify the implication of the relationship among (1) the U.S. standard of living, (2) U.S. population growth, (3) depletion of natural resources

INSTRUCTIONS:

2. Start the audio cassette tape and slides (for manually operated slide carousels, be sure the slide on the screen is the title slide or the blank colored slide in slot number one. Otherwise, the slides and tape will not be synchronized). Listen to the tape and view the slides until reference is made to question 1. Then STOP THE TAPE AND SLIDES.

Question 1

List factors that you think have contributed tc human overpopulation. (USE STUDENT RESPONSE SHEETS)

INSTRUCTIONS:

3. Restart the audio cassette tape. Listen to the tape and view the slides until reference is made to question 2. Then STOP THE TAPE AND SLIDES.

Question 2

List what you think are some possible consequences of human overpopulation. (USE STUDENT RESPONSE SHEETS)

INSTRUCTIONS:

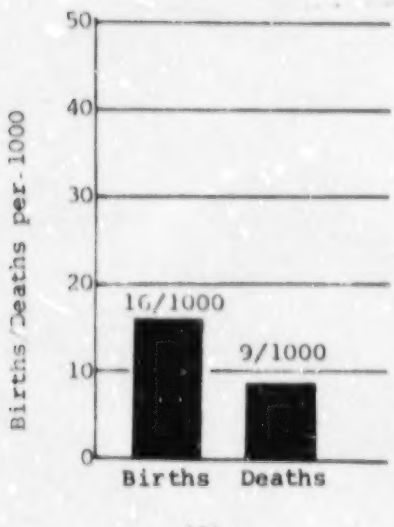
4. Restart the audio cassette tape. Listen to the tape and view the slides until reference is made to question 3. Then STOP THE TAPE AND SLIDES. Answer question 3 and also questions 4, 5, 6, and 7.

Question 3

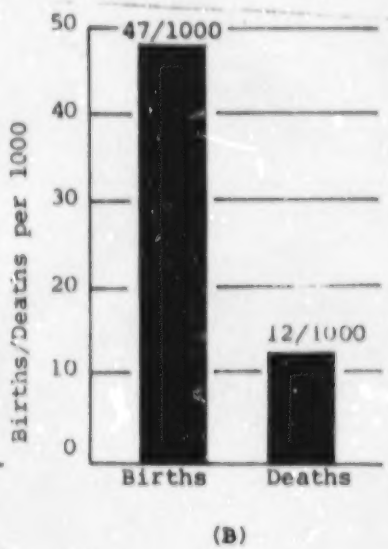
Transylvania has an annual birthrate of 15/1000 and an annual death-rate of 9/1000. A birthrate of 15/1000 means that each year 15 babies are born for every 1000 citizens of Transylvania, and a deathrate of 9/1000 means that each year 9 people die for every 1000 citizens of Transylvania. What is the annual population growth rate? (USE STUDENT RESPONSE SHEETS)

Question 4

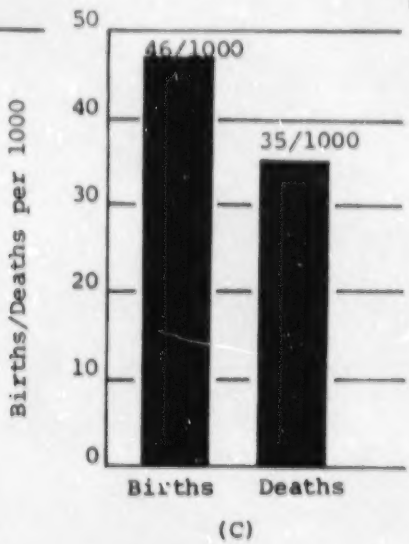
The country of Tropland was underdeveloped until 50 years ago. Since then it has received medical and economic aid from the United States. (1) Which graph would most likely describe the growth rate 50 years ago? (2) Which of the following graphs would you expect most accurately describes Tropland's current birthrate and deathrate? (USE STUDENT RESPONSE SHEET)



(A)



(B)



(C)

Question 5

Check the correct answer(s) on your STUDENT RESPONSE SHEET.

Zero Population Growth (ZPG) is a term which describes a population

__ in which no babies are born

__ in which nobody dies

__ in which the birthrate equals the deathrate

__ which is composed of only adults

__ which does not increase or decrease

Question 6

Check the correct answer(s) on your STUDENT RESPONSE SHEET.

A stable U.S. population (ZPG) would result in a higher U.S. standard of living than a growing U.S. population would because

__ people would save more money

__ inflation is good for the country's economy

__ real estate values would go up

__ there would be proportionately fewer children financially dependent on parents

Question 7

The United States and India are two countries on the planet Earth. Most Americans have cars and electrically-lighted and heated homes. A large number of Indians live in mud huts and are undernourished.

The American population is growing at the rate of one percent or less a year while India's population is expanding at an annual rate of three percent. American experts are advising the Indians that they are reproducing at too fast a rate. The Indians reply that it is the Americans, not themselves, who should be curbing their population growth.

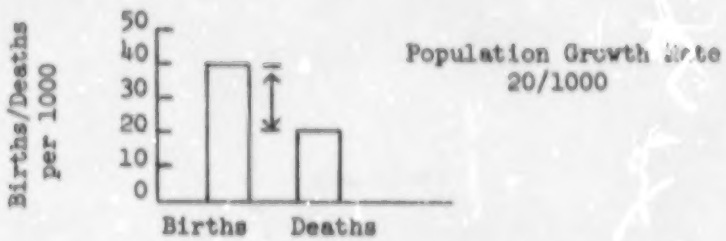
Give two reasons why the Indians might be right. (USE STUDENT RESPONSE SHEET)

You are now ready to play a game called PEOPLE. Read the following description of the game.

PEOPLE

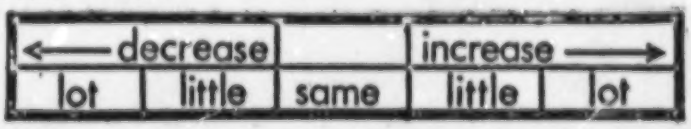
Description: The object of the game PEOPLE is to predict what effect certain events will have on the population growth rate of the country of Grokland. Your predictions will be made on the basis of what you have learned from this Learning Carrel Lesson.

You are given the following information about Grokland. Grokland is a developing country; it is also Catholic. At the beginning of the game, its population growth rate is very large as shown by the graph below. The arrow in the graph below will be reproduced on the slides as below to illustrate the base from which a given change might occur as a result of a specific event.



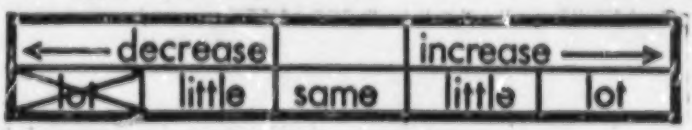
On the tape, you will be informed of events which occur in Grokland. You will have seven seconds to predict the effect of that event on the population growth rate.

You will have five choices; the population growth rate will react in one of the following ways: decrease a lot, decrease a little, stay the same, increase a little, increase a lot.



You are to mark an X in the square corresponding to your prediction.

Example: Black Plague epidemic



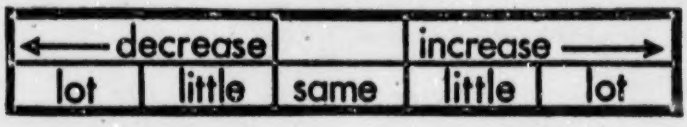
If you predicted that the Black Plague epidemic would decrease the population growth rate a lot, you would have placed an X in the square indicated above.

INSTRUCTIONS:

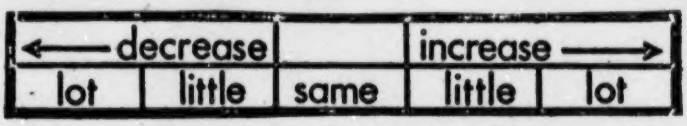
5. If you have questions about how to play the game, ask the Proctor. Then when you are ready to begin, restart the audio cassette tape and place an X in the box on the score sheet during the seven seconds allotted after the description of each event. DO NOT MARK IN THE SPACES BELOW. USE SEPARATE PEOPLE SCORE SHEET

PEOPLE GAME SCORE SHEET

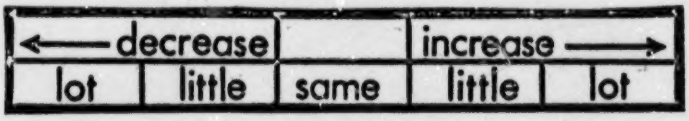
1. Event: Malaria eradicated



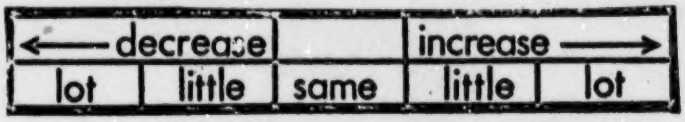
2. Event: Cancer cure discovered



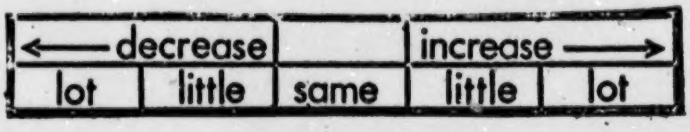
3. Event: Strong government birth control program



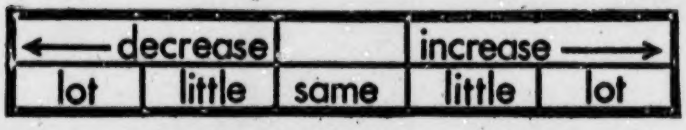
4. Event: Pope denounces birth control program



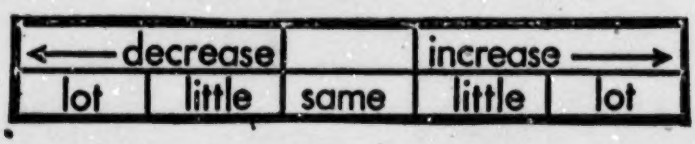
5. Event: Child-tax



6. Event: War



7. Event: Peace and prosperity



ANSWERS TO QUESTIONS IN STUDY GUIDE

QUESTION 1 Answers

development of tools
development of agriculture
longer human life span
medical advances
industrial revolution
peace

You may have thought of some more factors which aren't listed here.

QUESTION 2 Answers

behavior changes
crowding
depletion of resources
epidemics
lack of food
pollution
war

You may have thought of some more factors which aren't listed here.

QUESTION 3 Answers

6/1000 is the growth rate of Transylvania. Population growth rate is the difference between birthrate and deathrate.

QUESTION 4 Answers

1. (C); 2. (B)

QUESTION 5 Answers

in which the birthrate equals the deathrate
which does not increase or decrease

QUESTION 6 Answers

people would save more money
there would be proportionately fewer children financially dependent on parents

QUESTION 7 Answers

(1) Americans' high standard of living is depleting natural resources at a much faster rate than the Indians.

(2) Americans (at their high standard of living) are polluting the environment much more than are the Indians.

GLOSSARY

arithmetically: a progression in which there is equal spacing between divisions; example--2, 4, 6, 8, 10, 12, etc.

behavioral sink: an area in which social deterioration occurs due to extreme crowding.

birthrate: the ratio between number of births and number of individuals in a specified population and period of time often expressed as number of live births per thousand population.

deathrate: the ratio between number of deaths and number of individuals in a specified population and period of time; often expressed as number of deaths per thousand population.

demography: the statistical study of the characteristics of human populations especially with reference to size and density growth, distribution, migration and vital statistics and the effect of all these on social and economic conditions.

geometrically: a progression in which the ratio of each item to the one immediately preceding it is always the same number; example--2, 4, 8, 16, 32, 64, etc.

Malthusian theory: food production can only grow arithmetically, while population explodes geometrically. Therefore, there must eventually come a time when the population becomes larger than the food necessary to feed it. At this point, famine occurs.

population: the whole number of people or inhabitants occupying a specific geographical locality.

Zero Population Growth (ZPG): a population growth rate of zero. ZPG has the following characteristics: (1) the birthrate equals the deathrate, and (2) the average number of children per family is around 2.

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SCRIPT FOR LEARNING CARREL LESSON

6.1

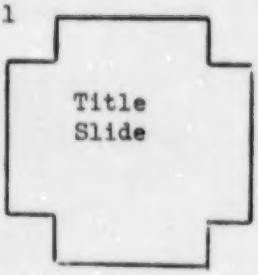
POPULATION

ENVIRONMENTAL STUDIES

A Cooperative Project of the Department of Geological Sciences and the Science Education Center.

THE UNIVERSITY OF TEXAS AT AUSTIN

1



2

Four billion human beings live on the planet Earth.

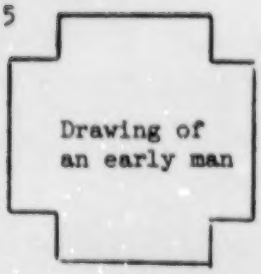
3

If human reproduction continues at the current rate, there will be six billion human beings in only thirty years. However, the Earth wasn't always so crowded.

4

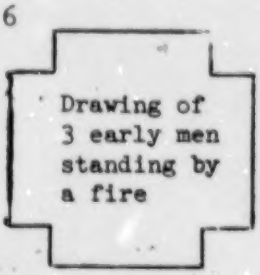
It all started hundreds of thousands of years ago. Early man and his family faced the same dangers as other animals: fire, predators, and famine.

5



As a result, his life span was less than half of what we enjoy today. A delicate balance between himself and nature was maintained, but as time went by, man changed.

6



His thumbs, his posture, the size and the shape of his brain. As these changes occurred, he started making tools.

7

Getting food and defending himself became easier, and he faired much better than his ancestors. The balance of nature had been changed. He learned to plant seeds, harvest his crops, and stored a portion of his yield for later periods of need.

8

Constructing permanent dwellings became feasible for the first time, resulting in an even more prosperous and comfortable life.

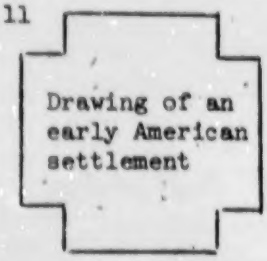
9

He continued to make more tools and to refine his farming techniques.

10

His life span increased. He learned faster and made greater advances while his numbers continued to grow, and grow.

11



Some areas began to get a little crowded. A few bad plagues and a famine or two made enormous dents in the population, but the survivors quickly filled the ranks.

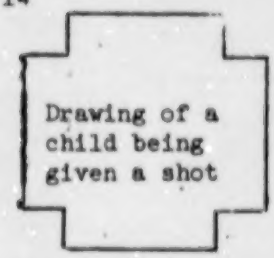
12

Man continued to make machines and tools. The industrial revolution and mass production arrived. More goods and services were produced than ever before,

13

and industry called upon an ever growing population for labor and markets.

14



Great strides were made in the field of medicine. More children survived infancy, fewer women died in childbirth, causing the population growth rate to increase sharply.

15

Occasional wars slowed the population growth in some parts of the world.

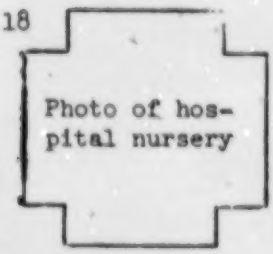
16

But it always picked up again when the soldiers came home.

17

The period since World War II has been one of unprecedented growth in industry and business ...

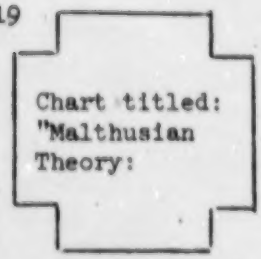
18



and in babies. The disadvantages and dangers of too many people occurred to very few.

Answer Question 1. Please stop the tape and restart when you have completed your answer.

19



As early as 1798, an English clergyman named Thomas Malthus theorized that food production can only grow arithmetically, while population explodes geometrically. As a result, he predicted large famines in areas where a growing population surpassed its ability to produce food.

20

However, the capacity of the earth to produce food has proven flexible. New strains of seed, improved fertilizer, and better harvesting methods constantly increase our yield from agriculture.

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Others look to the sea for a boundless supply of food and nutrients.

22

But despite past successes at feeding our peoples, many experts feel our numbers have already grown too large.

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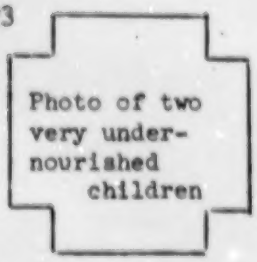

Too many people do create problems, and the most apparent one is the lack of food. Dr. Paul Ehrlich, author of The Population Bomb, has predicted

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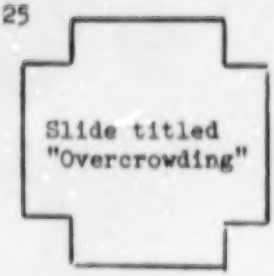
"Sometime between 1970 and 1985, the world will undergo vast famines .. hundreds of millions of people are going to starve to death."

25



But even if famines do not occur, we are still faced with the consequences of overcrowding people and property.

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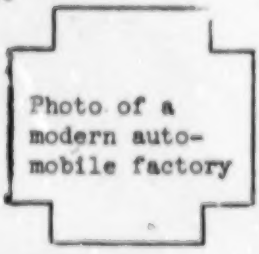

In the United States, the number of automobiles are multiplying three times faster than people, and five times faster than the highways,

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27

resulting in unprecedented traffic jams.

28

During the summer months, our national parks become outdoor slum areas, packed with 50,000 campers a day.

29

Universities are overcrowded. Students are identified by number instead of by name.

30

In a study using rats, John Calhoun found that startling behavior changes occur under extreme crowding conditions. These changes ranged from sexual deviation to cannibalism,

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31

and from frenetic overactivity to pathological withdrawal. Among female rats, the number of miscarriages increased and nest-building ability deteriorated.

Young rats were abandoned and left to die. Dr. Calhoun developed a term for the social deterioration occurring under extreme crowding:

32

he called it "behavioral sink."

33

Overpopulation has other harmful effects on our environment. Large populations use up their natural resources more quickly than small populations.

34

The more people there are in a town, the faster its freshwater supplies are used up.

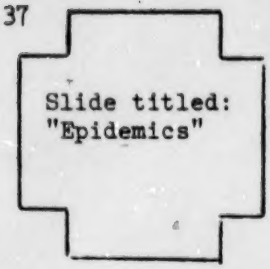
35

More people equal more cars, which mean more air pollution.

36

More people produce more sewage, and more sewage means more water pollution.

37



Crowded populations also mean a greater chance of disease and epidemics.

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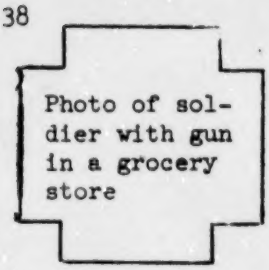


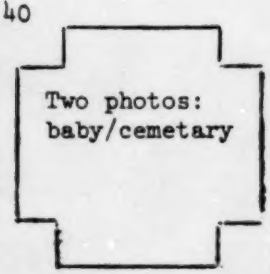
Some predict vast food wars with nation fighting nation just to fill empty bellies.

39

Food wars could trigger World War III, and the possible extinction of the human race.

Please answer Question 2. Please stop the tape now and restart when you have completed your answer.

40

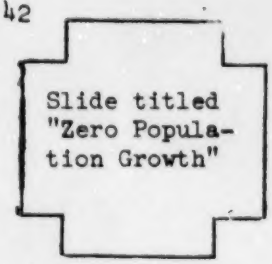


Every second four babies are born into the world, and two people die. This means that there are almost 8,000 more human beings living on this planet every hour.

41

Obviously, there would be no population explosion if the death rate of nations kept up with the soaring birthrate. Actually, it's not that people are being born at a faster rate than centuries ago; they're just living longer.

42



Zero Population Growth is a term which means no change in the size of a population. One way to achieve Zero Population Growth is for each individual to reproduce only one person to replace himself when he dies.

43

The impact of different birth rates is dramatically illustrated here. If a two-child family were achieved in the United States by 1975, we would have by the year 2060, three people for every two now. In contrast, if a three-child family were maintained, there would be seven people in 2060 for every two now.

44

Family planning and birth control measures have begun around the world to combat the threat of overpopulation.

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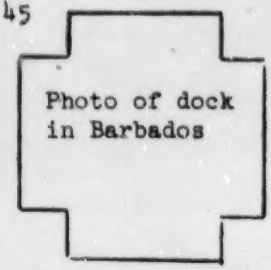


One outstanding success is Barbados, an island in the Carribean. Like the rest of Latin America, it is densely populated and poor.

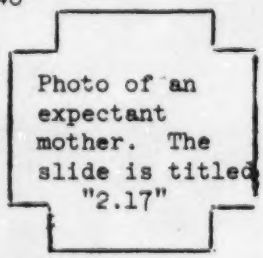
46

But due to family planning, Barbados has the lowest birth rate in the Western Hemisphere ... just eight tenths of one percent.

47

The United States has not been a leader in the field of birth and population control.

48



However, despite very little encouragement from officials, American women are now bearing an all-time low average of 2.17 children. This is below the figure required to achieve a U.S. Zero Population Growth. This decline is due to several distinct factors.

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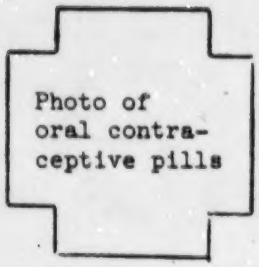
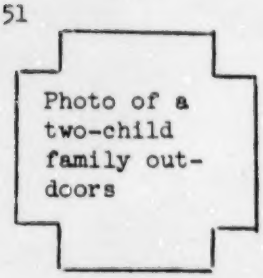


One has been the development of oral contraceptives, better known as "The Pill"

50

Another factor is increased educational and job opportunities for women.

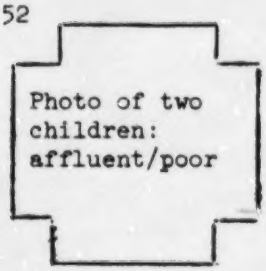
51



The third factor has been a rising standard of living for all Americans. It is a well-documented fact that the rich have fewer children than the poor.

Please answer Question 3. Stop the tape and restart when you have completed your answer.

52



As you saw earlier, the country with the highest standard of living uses up the most natural resources. It has been estimated that each United States citizen uses up 25 times the natural resources consumed by one citizen of India. This discrepancy is increasing all the time.

53

During the sixties, the United States population increased 13 percent while goods and services produced increased 60 percent.

This means depletion of natural resources also increased approximately 60 percent.

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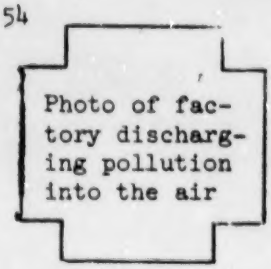


Because of the correlation between standards of living and pollution, some ecologists say Earth's atmosphere simply could not tolerate the pollution that would result if the rest of the world were raised to a United States' standard of living.

55

Current trends indicate that the standard of living in this country will continue to rise, at least in the near future. Shorter workweeks are not far away, and more vacationers will flood national parks and resorts.

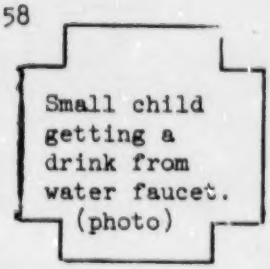
56

One-car families will become two-car families, and then three-car families. Air pollution from car emissions will increase.

57

Despite the many disagreements over causes and consequences of the problem, it is obvious that Zero Population Growth is the ultimate goal. Any growth rate, if continued, will eventually use up the earth.

58

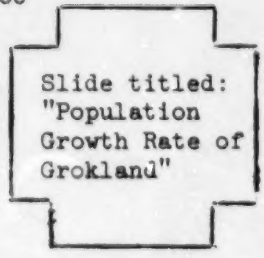


Someone has put it this way ... "If the sink is overflowing, do you turn off the faucet, or run for the mop?"

59

We are now going to play a game called PEOPLE. Your success at this game will depend on how much you have learned in the Learning Carrel lesson.

60

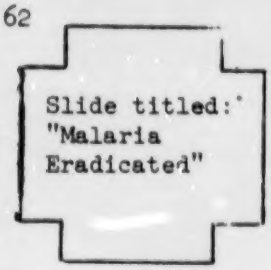


The object of this game is to predict what effect certain events will have on the population growth rate of the country of Grokland. Remember, population growth rate is the difference between the number of births and the number of deaths. If the number of births exceeds the number of deaths, the population is growing. If the deaths exceed the births, the population is shrinking.

61

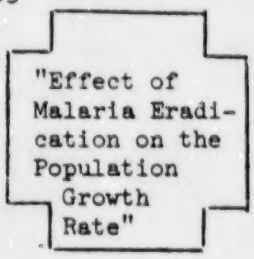
For each event, you must make one of the following responses: The population growth rate is decreasing, the population growth rate remains the same, or the population growth rate is increasing. You have seven seconds to choose your answer for each event.

62



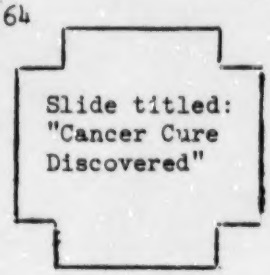
For example, DDT has been used to kill all malaria-bearing mosquitoes. Malaria had previously killed one-fourth of all children under six. What effect will this have on Grokland's population growth rate?

63



The birth rate will not change, but the death rate is greatly reduced. Therefore, there are many more births than deaths, and the population growth rate has increased a lot. Now, here's your first event.

64



A cure for cancer has been discovered. What effect does this have on the population growth rate?

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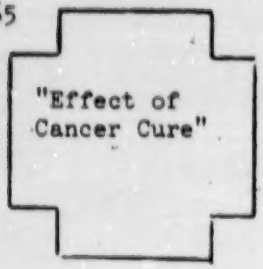

This should reduce the death rate a little. Since mainly older citizens past their reproduction stage are affected by cancer, this should not affect the birthrate. The overall effect is a slight increase in the population growth rate.

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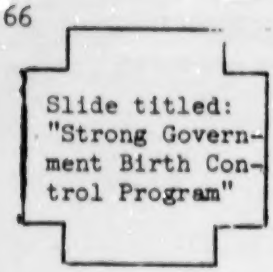
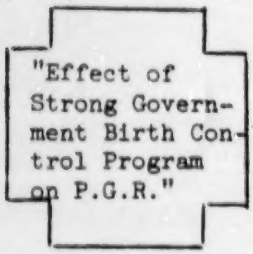


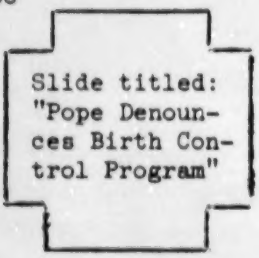
A very successful government birth control program is introduced in Grokland. What will be the effect of this on the country's population growth rate?

67



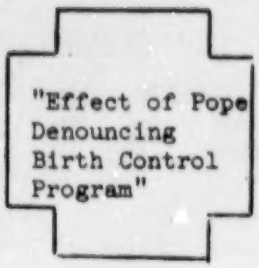
The birthrate should come way down, but the death rate will not be affected. The population growth rate, therefore, will decrease a lot.

68



The Pope makes a special trip to Grokland to publicly denounce the birth control program. How will this affect the population growth rate? Oh yes, Grokland is a predominantly Catholic country.

69



Since there are many Catholics in Grokland, we can safely assume that some couples will be persuaded to discontinue the use of birth control techniques, and the birth rate will again rise. This will result in at least a small increase of the population growth rate.

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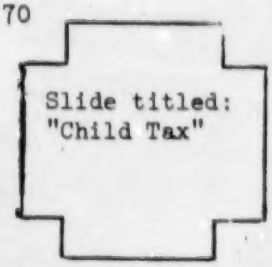
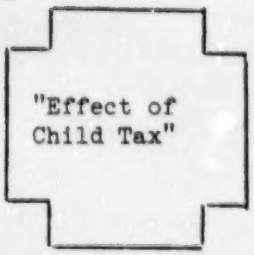


In response to the Pope's trip, the Grokland federal government has created a child tax. This means that every child born to a couple who already have at least two children will cost his parents $1,000 in extra taxes. How will this child tax affect the population growth rate?

71



Although we cannot be sure, we can predict that quite a few Groklanders' pocketbooks will hurt worse than their consciences, and the use of birth control materials will be continued. This will again reduce the population growth rate a lot.

72

A war between Grokland and its neighboring country breaks out. How does this affect the population growth rate?

73

Deaths during wartime increase greatly, due to bombs and battle fatalities. Since husbands and wives are separated, the birthrate goes way down. The death-rate is much greater than the birthrate, and the population growth rate has been decreased a lot.

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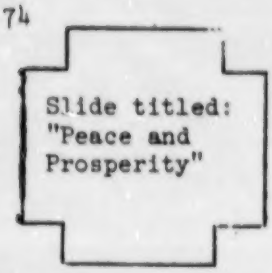

Grokland wins the war, and peace and prosperity reign. How does this affect the population growth rate?

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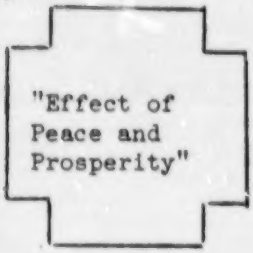
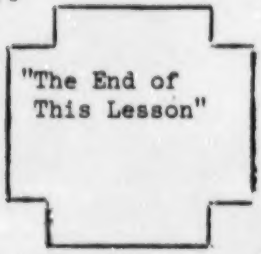


The proverbial baby boom follows the war. Therefore, the birthrate is up. The wartime deathrate is way down. Births are once again greater than deaths, and suddenly the population growth rate has increased a lot.

76



LESSON 6.1: POPULATION

STUDENT RESPONSE SHEETS

Name _____

Date _____

LESSON 6.1: POPULATION

STUDENT RESPONSE SHEET

Question 1: List factors that you think have contributed to human overpopulation.

Question 2: List what you think are some possible consequences of human overpopulation.

Question 3: Transylvania has an annual birthrate of 15/1000 and an annual deathrate of 9/1000. A birthrate of 15/1000 means that each year 15 babies are born for every 1000 citizens of Transylvania, and a deathrate of 9/1000 means that each year 9 people die for every 1000 citizens of Transylvania. What is the annual population growth rate of Transylvania?

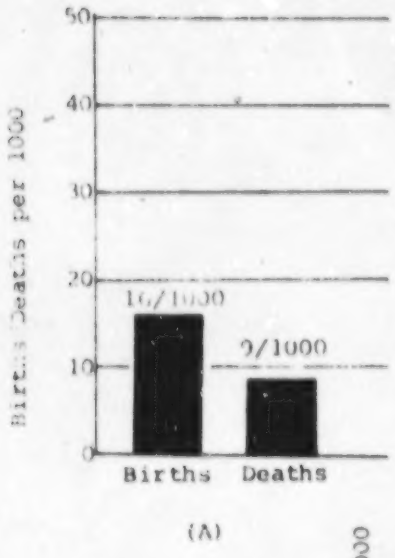
Name _____

Date _____

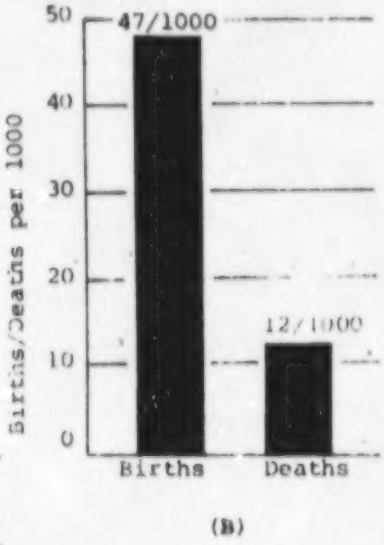
LESSON 6.1: POPULATION

STUDENT RESPONSE SHEET

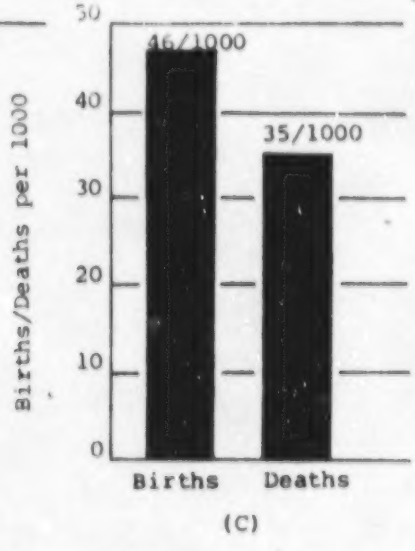
Question 4: The country of Tropland was underdeveloped until 50 years ago. Since then it has received medical and economic aid from the United States.
(1) Which graph would most likely describe the growth rate 50 years ago?
(2) Which of the following graphs would you expect most accurately describes Tropland's current birthrate and deathrate?



(A)



(B)



(C)

Name _____

Date _____

LESSON 6.1: POPULATION

STUDENT RESPONSE SHEET

Question 5: Check the correct answer(s).

Zero Population Growth (ZPG) is a term which describes a population

__ in which no babies are born

__ in which nobody dies

__ in which the birthrate equals the deathrate

__ which is composed of only adults

__ which does not increase or decrease

Question 6: Check the correct answer(s)

A stable U.S. population (ZPG) would result in a higher U.S. standard of living than a growing U.S. population would because

__ people would save more money

__ inflation is good for the country's economy

__ real estate values would go up

__ there would be proportionately fewer children financially dependent on parents

Question 7: The United States and India are two countries on the planet Earth. Most Americans have cars and electrically-lighted and heated homes. A large number of Indians live in mud huts and are undernourished.

The American population is growing at the rate of one percent or less a year while India's population is expanding at an annual rate of three percent. American experts are advising the Indians that they are reproducing at too fast a rate. The Indians reply that it is the Americans, not themselves, who should be curbing their population growth.

Give two reasons why the Indians might be right.

Name _____

Date _____

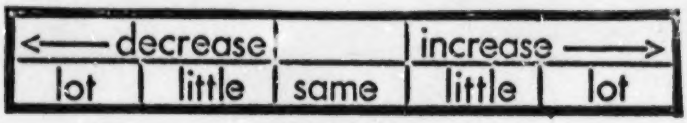
LESSON 6.1: POPULATION

PEOPLE GAME SCORE SHEET

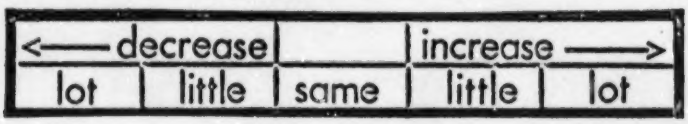
On the tape, you will be informed of events which occur in Grokland. You will have seven seconds to predict the effect of that event on the population growth rate.

You will have five choices: the population growth rate will react in one of the following ways: decrease a lot, decrease a little, stay the same, increase a little, increase a lot. You are to mark an X in the square corresponding to your prediction.

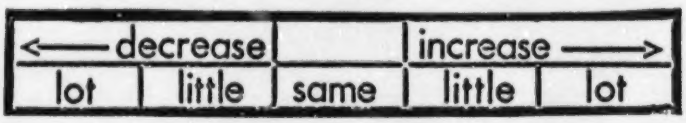
1. Event: Malaria eradicated



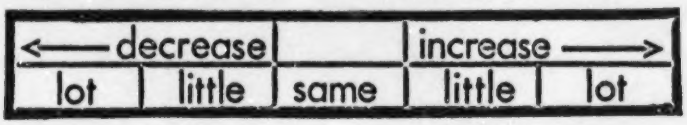
2. Event: Cancer cure discovered



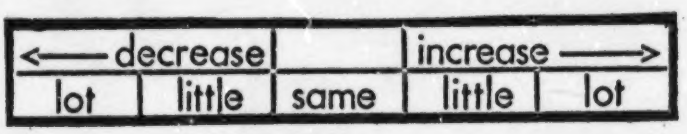
3. Event: Strong government birth control program



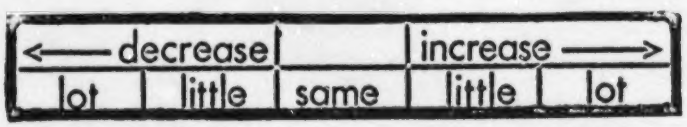
4. Event: Pope denounces birth control program



5. Event: Child tax



6. Event: War



7. Event: Peace and prosperity